



# TRE25RD SERIES 25 WATT I.T.E INTERCHANGEABLE PLUG ADAPTER

## Features

- Universal Input Range 90~264Vac
- High Efficiency up to 88%
- Interchangeable AC Plugs
- Class II
- No Load Input Power Consumption < 75mW
- Approval IEC/EN/UL 62368-1
- Approval EN55032 and CISPR/FCC Class B
- Operating Altitude 3000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meets CoC Tier 2 and DOE Level VI



AC Plug Sold Separately



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE1	VOLTAGE ACCURACY NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
TRE25RD050	5 V	4.0 A	50 mV	±2%	±1%	±6%	80%
TRE25RD090	9 V	2.5 A	90 mV	±2%	±1%	±5%	87%
TRE25RD120	12 V	2.1 A	120 mV	±2%	±1%	±5%	87%
TRE25RD150	15 V	1.67 A	150 mV	±2%	±1%	±3%	88%
TRE25RD180	18 V	1.4 A	180 mV	±2%	±1%	±2%	88%
TRE25RD240	24 V	1.05 A	240 mV	±2%	±1%	±2%	88%

Note:

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% full load.
3. Line regulation is measured from 100V<sub>ac</sub> to 240V<sub>ac</sub> with full load.
4. Load regulation measured from 60% to 100% full load and from 60% to 20% full load (60%±40% full load).
5. Typical efficiency at 230V<sub>ac</sub> and 75% full load at 25°C.

## PART NUMBER

Series	Output Voltage	AC Plug Type	DC Plug Type	Cable Type	Cable Length	Case Color
TRE25RD	XXX	-XXXX	-XX	X	XX	-XX-BK
25W I.T.E Adapter	050 : 5V 090 : 9V 120 : 12V 150 : 15V 180 : 18V 240 : 24V	Blank : Sold Separately ASUE : Include 4 Type	See Page 6	G : UL1571 with OVP	01 : 720mm 02 : 1220mm 03 : 1800mm 11 : 720mm with Ferrite Core 12 : 1220mm with Ferrite Core 13 : 1800mm with Ferrite Core See page 6 for restrictions	BE-BK : Black-Black RD-BK : Red-Black

Part Number Example:

TRE25RD120-11G13-BK-BK, 12V<sub>dc</sub> Output, DC Jack Type, Cable Length 1800mm with Ferrite Core, Case Color Black-Black

TRE25RD120-ASUE-11G03-BE-BK, 12V<sub>dc</sub> Output, include 4 Type AC Plug, DC Jack Type, Cable Length 1800mm, Case Color Blue-Black



# TRE25RD Series

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	90		264	V <sub>ac</sub>
			120		370	V <sub>dc</sub>
Operating Temperature	See Derating Curve	All	-20		60	°C
Storage Temperature		All	-20		85	°C
Input/Output Isolation Voltage	1 minute	All			3000	V <sub>ac</sub>
Operating Altitude		All			3000	m

### INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V <sub>ac</sub>
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V <sub>in</sub> =100V <sub>ac</sub>	All			0.7	A
Leakage Current (Earth)		All			250	uA
Under Voltage Protection		All	60	68	75	V <sub>ac</sub>
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold start at 25°C	All			60	A

### OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> , I <sub>o</sub> =60% Full load T <sub>c</sub> =25°C	TRE25RD050	4.9	5	5.1	V <sub>dc</sub>
		TRE25RD090	8.82	9	9.18	
		TRE25RD120	11.76	12	12.24	
		TRE25RD150	14.7	15	15.3	
		TRE25RD180	17.64	18	18.36	
		TRE25RD240	23.52	24	24.48	
Operating Output Current Range	V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> , T <sub>c</sub> =25°C	TRE25RD050	0		4	A
		TRE25RD090	0		2.5	
		TRE25RD120	0		2.1	
		TRE25RD150	0		1.67	
		TRE25RD180	0		1.4	
		TRE25RD240	0		1.05	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		10		ms
Output Voltage Regulation						
Load Regulation	60%±40% Full load change	TRE25RD050			±6.0	%
		TRE25RD090			±5.0	
		TRE25RD120			±5.0	
		TRE25RD150			±3.0	
		TRE25RD180			±2.0	
		TRE25RD240			±2.0	
Line Regulation	V <sub>in</sub> =High line to low line, full load	All			±1.0	%
Over Voltage Protection	IC Component to clamp (auto recovery)	TRE25RD050		7.44		V <sub>dc</sub>
		TRE25RD090		13.6		
		TRE25RD120		16.2		
		TRE25RD150		18.9		
		TRE25RD180		23.5		
		TRE25RD240		28.8		
Over Current Protection	Auto recovery	All	110		140	%
Short Circuit Protection	Auto recovery	All				



# TRE25RD Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Ripple and Noise	1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25°C	TRE25RD050			50	mV
		TRE25RD090			90	
		TRE25RD120			120	
		TRE25RD150			150	
		TRE25RD180			180	
		TRE25RD240			240	
Load Capacitance	1. $V_{in}=115V_{ac}$ and $230V_{ac}$ 2. Output is max. load 3. Ambient temperature=25°C	TRE25RD050			4000	uF
		TRE25RD090			2500	
		TRE25RD120			2100	
		TRE25RD150			1670	
		TRE25RD180			1400	
		TRE25RD240			1050	
Efficiency	1. $V_{in}=230V_{ac}$ 2. Output is 75% full load 3. Ambient temperature=25°C	TRE25RD050		80%		%
		TRE25RD090		87%		
		TRE25RD120		87%		
		TRE25RD150		88%		
		TRE25RD180		88%		
		TRE25RD240		88%		

## ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute (without dielectric breakdown)	All			3000	$V_{ac}$
Isolation Resistance	Input to output	All	100			MΩ

## FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency		All		65		kHz

## GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	$I_o=100\%$ ; $T_a=25^\circ C$ per MIL-HDBK-217F	All	300			k hours
Humidity	Non-condensing	All			93	% RH
Shock	MIL-STD-810F Table 516.5, TABLE 516.5-1 10ms, each axis 3 times( $\pm X$ 、 $\pm Y$ 、 $\pm Z$ axis)	All		75		g
Vibration	MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X、Y、Z axis, 1 hour(each axis),. total 3 hours.	All		4		g
Weight		All		140		grams
Dimension		All	2.795x1.906x1.299 inches (71.00x48.40x33.00 mm)			
Safety	Class II, IEC 62368-1:2014 EN 62368-1:2014/A11:2017 UL 62368-1, 2nd Edition					Ed 2.0
EMC Emission	EN55032:2015+AC:2016, EN61000-3-2:2014, EN6100-3-3:2013, FCC CFR 47 Part 15					
Conducted Disturbance	EN55032:2015+AC:2016					Class B
Radiated Disturbance	EN55032:2015+AC:2016					Class B
Harmonic Current Emissions	EN 61000-3-2: 2014					Class A
Voltage Fluctuations & Flicker	EN 61000-3-3: 2013					Criterion A
EMC Immunity	EN 55024:2010+A1:2015, EN 61204-3, IEC 61000-4-2, 3, 4, 5, 6, 8, 11					Criterion A
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air Discharge: $\pm 8kV$ Contact Discharge: $\pm 4kV$					Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2006+A1:2007+A2:2010					Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, $\pm 1kV$					Criterion A



# TRE25RD Series

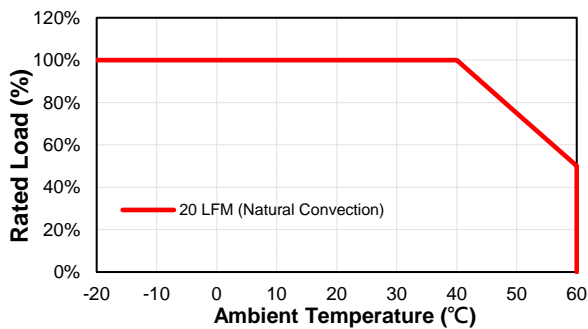
## GENERAL SPECIFICATIONS

Surge	IEC 61000-4-5 2014+A1:2017, L-N $\pm 0.5kV$ , $\pm 1kV$	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013	Criterion A
Power Frequency Magnetic Field	IEC 61000-4-8:2009	Criterion A
Voltage Dips	IEC 61000-4-11:2004+A1:2017, Dips:30% reduction, Dips: >95% Reduction	Criterion A
Voltage Interruptions	IEC 61000-4-11:2004+A1:2017, >95% Reduction	Criterion B
Application Note Link	<a href="#">TRE25RD Series App Notes</a>	

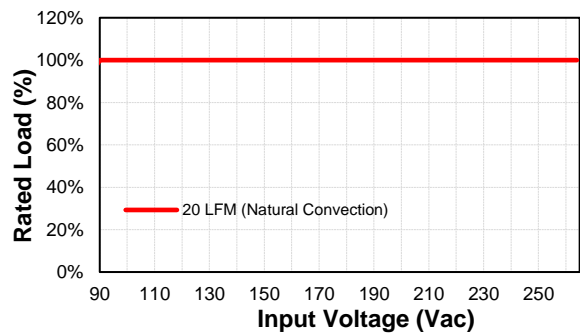
## CHARACTERISTIC CURVE

### Power Derating Curve

TRE25RD Derating Curve

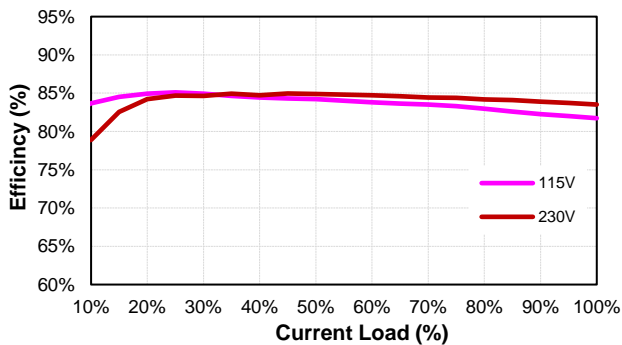


TRE25RD Input Voltage Derating Curve

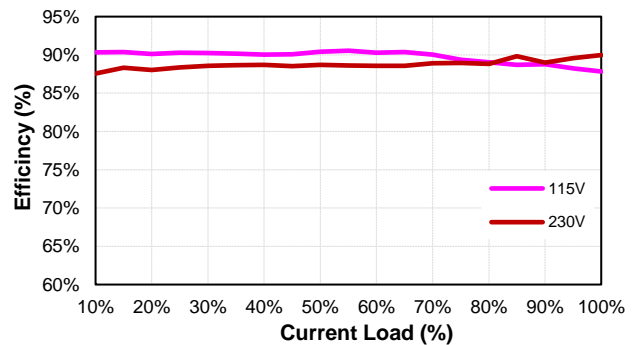


### Performance Data

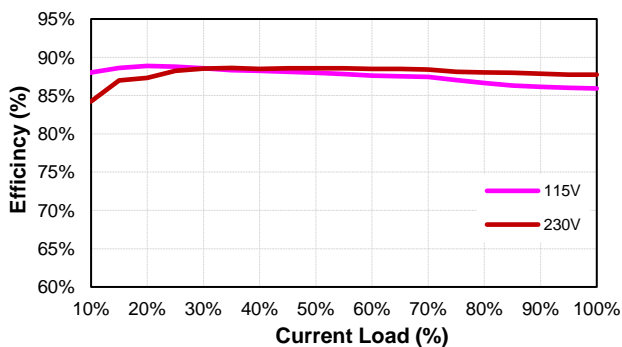
TRE25RD050 (Eff Vs Io)



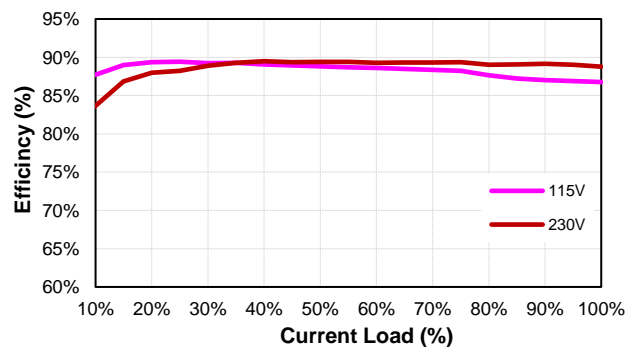
TRE25RD090 (Eff Vs Io)



TRE25RD120 (Eff Vs Io)



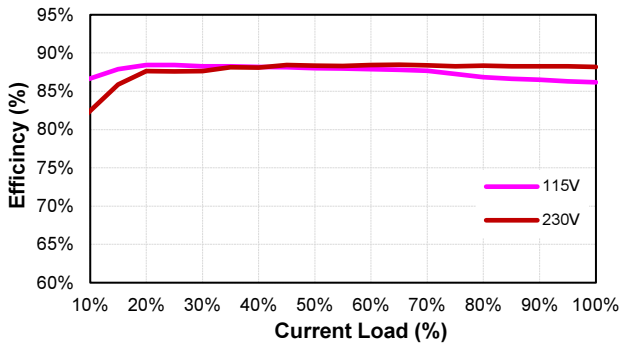
TRE25RD150 (Eff Vs Io)



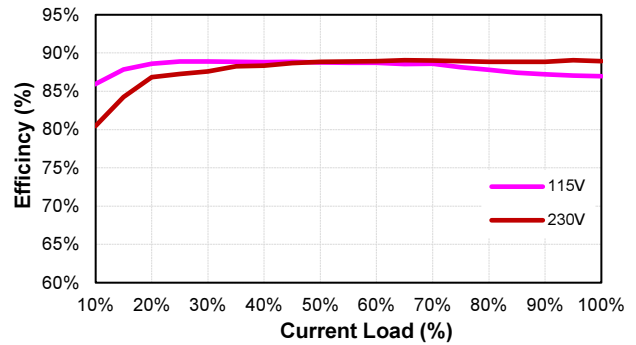


# TRE25RD Series

TRE25RD180 (Eff Vs Io)

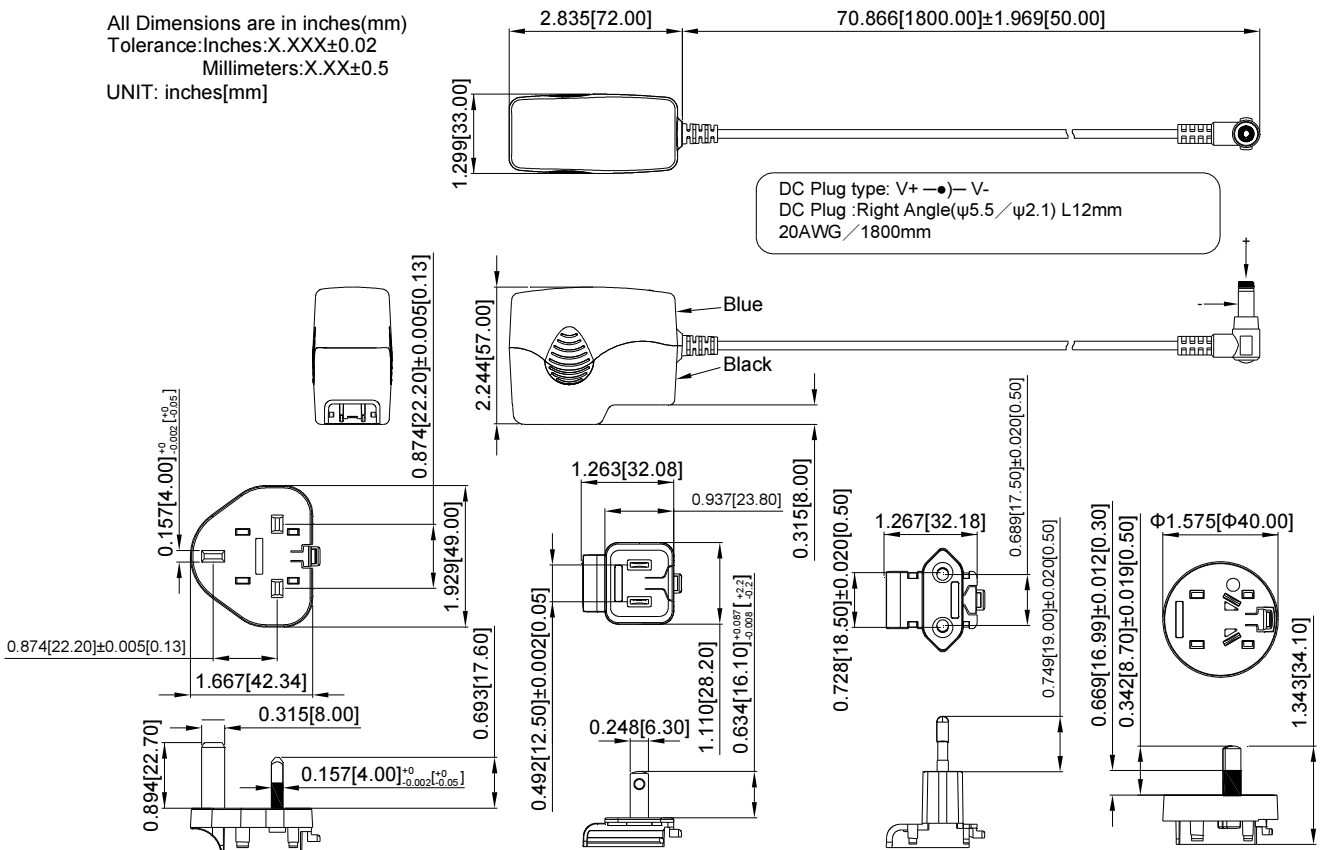


TRE25RD240 (Eff Vs Io)



## MECHANICAL SPECIFICATION

All Dimensions are in inches(mm)  
 Tolerance: Inches: X.XXX±0.02  
 Millimeters: X.XX±0.5  
 UNIT: inches[mm]



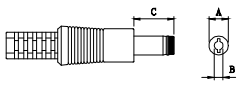
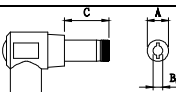
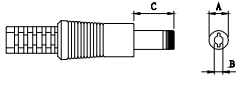
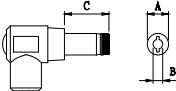
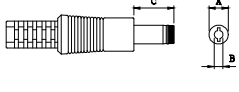
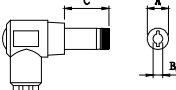
## INTERCHANGEABLE AC PLUG SPECIFICALLY for TRE25RD (SOLD SEPARATELY)

TYPE				
	U.K type (U)	American type (A)	European type (E)	Australian type (S)
ORDER NO.	AC PLUG RE-U	AC PLUG RE-A	AC PLUG RE-E	AC PLUG RE-S



# TRE25RD Series

## Standard Output Dc Plug

DC Plug Type	Cable Number-XXXXX	A	B	C	Cable Type	Cable Length	Cable AWG
		OD (mm)	ID (mm)	L (mm)			
 Straight/Inner+Outer- + ● - -	11G03	Φ5.5	Φ2.1	12	UL1571	1800mm without Core	20AWG for 12V, 15V, 18V, 24V
	12G03	Φ5.5	Φ2.5	12			
	23G03	Φ5.5	Φ2.1	9.5			
	26G03	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● - -	01G03	Φ5.5	Φ2.1	12			
	02G03	Φ5.5	Φ2.5	12			
	21G03	Φ5.5	Φ2.5	9.5			
	24G03	Φ5.5	Φ2.1	9.5			
 Straight/Inner+Outer- + ● - -	11G03	Φ5.5	Φ2.1	12	UL1571	1800mm without Core	18AWG for 9V
	12G03	Φ5.5	Φ2.5	12			
	23G03	Φ5.5	Φ2.1	9.5			
	26G03	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● - -	01G03	Φ5.5	Φ2.1	12			
	02G03	Φ5.5	Φ2.5	12			
	21G03	Φ5.5	Φ2.5	9.5			
	24G03	Φ5.5	Φ2.1	9.5			
 Straight/Inner+Outer- + ● - -	11G02	Φ5.5	Φ2.1	12	UL1571	1220mm without Core	16AWG for 5V
	12G02	Φ5.5	Φ2.5	12			
	23G02	Φ5.5	Φ2.1	9.5			
	26G02	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● - -	01G02	Φ5.5	Φ2.1	12			
	02G02	Φ5.5	Φ2.5	12			
	21G02	Φ5.5	Φ2.5	9.5			
	24G02	Φ5.5	Φ2.1	9.5			

※Other DC Plug Type please refer to the link: <https://www.cincon.com/productdownload/TRE25RD-cable-DC-plug.pdf>

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